DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA725)

Current Human Exposures Under Control

Facility Name: **American Steel Foundries - Sebring Facility**
Facility Address: **Lake Park Blvd. and Heacock Road, Smith Township, OH**
Facility EPA ID #: **OHD 017 497 587**

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

   ✔ If yes - check here and continue with #2 below.

   _____ If no - re-evaluate existing data, or

   _____ if data are not available skip to #6 and enter"IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

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2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective risk-based "levels" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

	Yes	No	?	Rationale / Key Contaminants
Groundwater	✔			Nickel, Fluorides. See (a) below.
Air (indoors)[2]		✔		There are no structures present. The constituents of concern are not volatile. See (b) below.
Surface Soil (e.g., <2 ft)	✔			Mercury, Fluorides, Phenols. See (c) below.
Surface Water		✔		See (d) below.
Sediment		✔		See (d) below,
Subsurf. Soil (e.g., >2 ft)	✔			Mercury, Fluorides, Phenols. See (c) below.
Air (outdoors)		✔		The constituents of concern are not volatile. See (b).

_____ If no (for all media) - skip to #6, and enter "YE," status code after providing or citing appropriate "levels," and referencing sufficient supporting documentation demonstrating that these "levels" are not exceeded.

✔ If yes (for any media) - continue after identifying key contaminants in each "contaminated" medium, citing appropriate "levels" (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

_____ If unknown (for any media) - skip to #6 and enter "IN" status code.

Rationale and Reference(s):

a) *Ohio EPA Interoffice Correspondence*, from Mr. Rich Kurlich, DDAGW, NEDO to Ahmed Hawari, DHWM, NEDO, June 23, 1999, Twinsburg, Ohio. Fluoride and Nickel have been detected in groundwater at levels above Maximum Contaminant Limits. Manganese, zinc and sulfates have also been detected in groundwater at levels above statistical background (*Supplemental Annual Report of 1999 Interim Status Groundwater Monitoring Information*, Civil and Environmental Consultants Incorporated, February 22, 2000, Cleveland, Ohio.) Please note that none of these constituents can be directly associated with the hazardous waste that was disposed in the unit.

b) The most volatile constituent of concern, phenol, has a Henry's Law Constant around 4 E-7 atm-m^3 / mol, two orders of magnitude below Ohio EPA screening criteria for the evaluation of volatile constituents. Due to the nature of the waste material and the substrate, fugitive dust and other particulate emissions have not been observed. Extensive coverage of the waste material by non-hazardous foundry sand has taken place as a result of a pre-loading, surcharge project.

c) *Report on Determination of Vertical Extent and Quantity of Chromite Sand, Sebring, Ohio, Landfill*, RMT Incorporated, September 1999, Dublin, Ohio. These data were based on extract testing. However, they adequately demonstrate that the material in the landfill meets Ohio EPA chemical criteria for spent, non-toxic foundry sand.

Hazardous waste derived from emission control dust from the *secondary* production of steel in electric arc furnaces, characteristic for cadmium (D006) and lead (D008), had been placed in the unit. The unit also received large quantities of clarifier sludge, spent foundry sand, non-hazardous air pollution control dusts, broken core butts, shell cores, alphaset cores, baked cores, foundry slag, refractory brick, floor sweepings and scrap metal. The total material in the landfill is estimated to be around 660,000 tons, while the hazardous waste placed in the unit is estimated to be around 275 tons. The hazardous waste thus makes up roughly 0.04% of the material, and the characteristics are more than likely diluted to near undetectable levels.

Extensive sampling and analysis was conducted. Ninety-six samples were treated with the ASTM Water Leaching Procedure Method D-3987-85, and the resulting extracts analyzed for a suite of metals. 'Total', 'as is' data would have been preferred. Nevertheless, all samples were below the reporting limits for cadmium (0.005 mg/L) and lead (0.10 mg/L). This allows a conclusion that soils have been minimally affected by the hazardous waste placement to be made with a high degree of confidence.

There are indications that chromium may be present at levels above Ohio EPA's trivalent Generic Cleanup Number of 20,700 mg/kg. Chromite sands may be present at levels of approximately 10% . Other Appendix VIII metallic and inorganic constituents may be present, but they have not been sought because of the proposed method of closure (clean closure by removal).

Waste characterization is currently the main issue, since its composition must be known for the extraction and recycling process. The waste is easily distinguished from native soils by eye, and the only proposed site characterization sampling will not take place until after the waste has been removed.

d) Wastes were disposed in one leg of an ell-shaped strip mining pit. A low permeability barrier was constructed to isolate landfill materials from the adjacent pond in 1996. There appears to be a net inward gradient from the pond to the landfill (*Letter Dated July 19, 1996*, from Roy F. Weston Incorporated, Vernon Hills, Illinois, to John Palmer, Ohio EPA, Twinsburg, Ohio).

The facility is adjacent to an intermittent stream, and is approximate 3/4 mile from the Mahoning River. It is therefore possible that run-off is a factor that may influence surface water and sediment. The ASTM Water Leaching Method data (noted above) were assumed to be a conservative model of run-off impact on surface water inside the mixing zone. Of the eleven metals and inorganics tested, only mercury, phenolics, and fluoride were found above detection limits.

The Mahoning River in this area is designated Warm Water Habitat. The leachate data compare to Inside Mixing Zone Average Water Quality Criteria (State of Ohio), and Drinking Water Maximum Contaminant Limits, as follows:

The mercury data were heavily censored, with less than 10% of the samples showing a positive detection. Of those samples, almost all were exactly at the detection limit of 2 µg/L. The single sample result of 3 µg/L represents the maximum detection. This was the only exceedence of the Water Quality Standard of 2.2 µg/L. The Maximum Contaminant Limit for mercury is 2 µg/L.

Phenolic compounds were consistently detected at low levels. The maximum value was 8000 µg/l, with all other results an order of magnitude lower. There were no exceedences of the Water Quality Standard of 11,000 µg/L. There are no Maximum Contaminant Limits established for this analyte.

Fluoride was also consistently detected in the general range of 50 to 250 µg/L. The maximum detection was 350 µg/L. There is no Inside Mixing Zone Average Water Quality Criterion for this analyte. However, the Public Water Supply Criterion listed is 1800 µg/L, and the Agricultural Water Supply Criterion listed is 2000 µg/L. There is no Primary Maximum Contaminant Limit for this analyte, however, the Secondary Maximum Contaminant Limit is 2000 µg/L.

Therefore, the potential for run-off to be classifiable as contaminated is low. Note also that run-off from the porous foundry sand is minimal. This information allows a conclusion that surface waters have been minimally affected by the hazardous waste placement to be made with a high degree of confidence. It is further believed that any impact upon sediments should be of no consequence to ecological receptors.

Footnotes:

[1] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

[2] Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

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3. Are there **complete pathways** between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

Potential **Human Receptors** (Under Current Conditions)

"Contaminated" Media	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food[3]
Groundwater	No	No	No	Yes			No
~~Air (indoors)~~	-	-	-				
Soil (surface, e.g., <2 ft)	No	No	No	Yes	Yes	No	No
~~Surface Water~~	-	-			-	-	-
~~Sediment~~	-	-			-	-	-
Soil (subsurface e.g., >2 ft)				Yes	No		
~~Air (outdoors)~~	-	-	-	-	-		

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors' spaces for Media which are not "contaminated") as identified in #2 above.

2. Enter "yes" or "no" for potential "completeness" under each "Contaminated" Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential "Contaminated" Media - Human Receptor combinations (Pathways) do not have check spaces ("___"). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

_____ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

__✔__ If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) - continue after providing supporting explanation.

_____ If unknown (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and enter "IN" status code

Rationale and Reference(s):

Residents: There are no residences on the site, and access is restricted by security and fencing.[4] There are no down-gradient receptors for groundwater.[5]

Workers: There are no production facilities at the site.[4] There are no down-gradient receptors for groundwater.[5]

Day Care: There are no day care facilities on the site, and access is restricted by security and fencing.[4] There are no down-gradient receptors for groundwater.[5]

Recreation: There are no recreational activities at the site, and access is restricted by security and fencing.[4]

Construction: Construction workers are a receptor of concern. They are present now for a surcharge project, and they will be excavating the site for the clean closure. Exposure to contaminated surface soils, subsurface soils, groundwater and wastes will be possible.

Trespassers: Although the property has a fence, a vigorous fence inspection and repair program, and routine security checks, some evidence of trespass activity has been noted in the past. Exposure to surface soils and waste may be possible. Current exposure of trespassers to subsurface soils is not possible, but this situation will change as excavation activities begin at the site.

Food: There is no agricultural activity on or adjacent to the site.[6]

[3] Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

[4] Personal observations made by John B. Palmer and Joseph Loucek, District Representatives, Ohio EPA's Northeast District Office. See also the Letter of Compliance dated December 13, 1999, and the checklist for the December 8, 1999 inspection, in which no security violations were found.

[5] The horizontal and vertical extent of groundwater contamination has been established. There are no receptors within this plume. Immediately downgradient of the facility is a closed municipal landfill. There are residences with groundwater wells approximately one-half mile downgradient on Bandy Road. However, several ditches and swales are located between, and it is unlikely that groundwater from the site would ever be able to directly affect these wells. Any anthropogenic source currently present will be excavated and removed according to the current proposed closure remedy. See Appendix I of the June 6, 2000 closure plan for details on the groundwater and hydrogeology of the site, and on the monitoring and detection plan (Appendix I was omitted from the September 2000 submittal because no changes were made to it, and the paper saving was substantial).

[6] Personal observations made by John B. Palmer and Joseph Loucek, District Representatives, Ohio EPA's Northeast District Office.

4 Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **"significant"**[7] (i.e., potentially "unacceptable" because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination"); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks)?

✔ If no (exposures can not be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) - skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

_____ If yes (exposures could be reasonably expected to be "significant" (i.e., potentially "unacceptable") for any complete exposure pathway) - continue after providing a description (of each potentially "unacceptable" exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

_____ If unknown (for any complete pathway) - skip to #6 and enter "IN" status code

Rationale and Reference(s):

Construction Workers: Activities at the site are restricted by a Health and Safety Plan, which prescribes (among other things) chemical hazard evaluation, levels of personal protective protection, and air monitoring. See Section Six of the September 12, 2000 Closure Plan for details.

Trespassers: Due to on-going security measures exercised by American Steel Foundries, exposure frequency and exposure time should be sufficiently curtailed that actual exposures would be insignificant. These measures include weekly inspections, a fence inspection and repair program, and regular visits by both site workers and main plant security. Future exposures will be eliminated by removal of the waste and contaminated media, the remedy selected for closure.

[7] If there is any question on whether the identified exposures are "significant" (i.e., potentially "unacceptable") consult a human health Risk Assessment specialist with appropriate education, training and experience.

5 Can the "significant" **exposures** (identified in #4) be shown to be within **acceptable** limits?

_____ If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing and referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

_____ If no (there are current exposures that can be reasonably expected to be "unacceptable")- continue and enter "NO" status code after providing a description of each potentially "unacceptable" exposure.

_____ If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code

Rationale and Reference(s):

6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

✔ YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the American Steel Foundries Sebring facility, EPA ID # OHD 017497587, located at Lake Park Boulevard and Heacock Road, Smith Township, Ohio, under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

____ NO - "Current Human Exposures" are NOT "Under Control."

____ IN - More information is needed to make a determination.

Completed by: [signature] Reviewed by: [signature]
Date: January 23, 2001 Date: 01/23/01

John Palmer
Environmental Specialist 3
Ohio EPA, NEDO, DHWM

Wade Balser
Environmental Specialist 2
Ohio EPA, NEDO, DHWM

Supervisor: [signature]
Date: 01/23/01

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Ohio EPA, NEDO, DHWM

Locations where References may be found:

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Twinsburg, Ohio 44087
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FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.

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DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA750)

Migration of Contaminated Groundwater Under Control

Facility Name: **American Steel Foundries - Sebring Facility**
Facility Address: **Lake Park Blvd. and Heacock Road, Smith Township, OH**
Facility EPA ID #: **OHD 017 497 587**

1. Has **all** available relevant/significant information on known and reasonably suspected releases to the groundwater media, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

   ✔ If yes - check here and continue with #2 below.

   _____ If no - re-evaluate existing data, or

   _____ if data are not available, skip to #8 and enter"IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Migration of Contaminated Groundwater Under Control" EI

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated ground water and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

2. Is **groundwater** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective "levels" (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

   ✔ If yes - continue after identifying key contaminants, citing appropriate "levels," and referencing supporting documentation.

   _____ If no - skip to #8 and enter "YE" status code, after citing appropriate "levels," and referencing supporting documentation to demonstrate that groundwater is not "contaminated."

   _____ If unknown - skip to #8 and enter "IN" status code.

   Rationale and Reference(s): *Ohio EPA Interoffice Correspondence*, from Mr. Rich Kurlich, DDAGW, NEDO to Mr. Ahmed Hawari, DHWM, NEDO, June 23, 1999, Twinsburg, Ohio. Fluoride and Nickel have been detected in groundwater at levels above Maximum Contaminant Limits. Manganese, zinc and sulfates have also been detected in groundwater at levels above statistical background (*Supplemental Annual Report of 1999 Interim Status Groundwater Monitoring Information*, Civil and Environmental Consultants Incorporated, February 22, 2000, Cleveland, Ohio.) Please note that none of these constituents can be directly associated with the hazardous waste that was disposed in the unit, which bore the toxicity characteristic for cadmium and lead.

Footnotes:

[1]"Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate "levels" (appropriate for the protection of the groundwater resource and its beneficial uses).

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3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within "existing area of contaminated groundwater"[2] as defined by the monitoring locations designated at the time of this determination)?

✔ If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the "existing area of groundwater contamination"[2]).

_____ If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the "existing area of groundwater contamination"[2]) - skip to #8 and enter "NO" status code, after providing an explanation.

_____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s): The site was initially developed as a strip mine to extract coal and clay. The strip pit eventually formed an ell shape, with a long leg running north-to-south, and a short leg extending east from the southern portion of the long leg. After mining operations ceased, the strip pit filled with groundwater and precipitation. Eventually, solid and hazardous wastes were disposed in the long leg, displacing and absorbing the water. (The hazardous waste was characteristic, toxic for lead and cadmium. It was approximately 0.04% by weight of the waste stream.)

This disposal practice left the long leg of the pit filled with saturated materials which were firm enough to support heavy machinery. The short leg remains filled with water, and is currently used as the outfall of a waste water treatment plant serving an adjacent trailer park. A low permeability barrier was constructed to isolate landfill materials from the short leg pond in 1996. Sediments from the landfill that were suspected to be contaminated, were scooped out of the pond, and incorporated into the existing waste materials.

There appears to be a net inward water pressure gradient from the pond to the landfill (*Letter Dated July 19, 1996*, from Roy F. Weston Incorporated, Vernon Hills, Illinois, to John Palmer, Ohio EPA, Twinsburg, Ohio).

The horizontal and vertical extent of groundwater contamination has been established. Any anthropogenic source (waste materials or contaminated soils) currently present will be excavated and removed according to the current proposed closure remedy. Monitoring will continue on a quarterly basis until all wastes and contaminated materials are removed from the site. It is expected that the removal of the source will mitigate the groundwater contamination. Eight quarters of confirmatory sampling will be performed after the removal to ensure that the groundwater remains unaffected by any unknown sources attributable to the unit. Failure to remediate any anthropogenic constituents of concern will require the facility to submit an amended closure plan. (Because the unit is a former coal mine, some constituents identified in the groundwater may not be attributable to anthropogenic activities.)

The Groundwater Monitoring Plan is designed to meet the interim status requirements of 40 CFR 265. The closure plan approval process does not anticipate moving the landfill into the facility requirements of 40 CFR 264 since clean closure is the proposed remedy. Should the facility find itself unable to clean close, it will be required to amend the closure plan, and post-closure issues would be addressed at that time.

See Appendices I and J of the June 2000 *Landfill Closure / Post Closure Plan Revision No. 3* for details on the groundwater and hydrogeology of the site, and on the monitoring and detection plan. (The June submittal was a proposal to close in-place. The clean closure proposal was submitted in September. These groundwater appendices were omitted from the September 2000 submittal because no changes were made to them, and the paper saving was substantial.)

[2] "existing area of contaminated groundwater" is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of "contamination" that can and will be sampled/tested in the future to physically verify that all "contaminated" groundwater remains within this area, and that the further migration of "contaminated" groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

4. Does "contaminated" groundwater **discharge** into **surface water** bodies?

_____ If yes - continue after identifying potentially affected surface water bodies.

__✔__ If no - skip to #7 (and enter a "YE" status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater "contamination" does not enter surface water bodies.

_____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s): A low permeability barrier was constructed to isolate landfill materials from the short leg pond in 1996. (See #3, above.) There appears to be a net inward water pressure gradient from the pond to the landfill (*Letter Dated July 19, 1996*, from Roy F. Weston Incorporated, Vernon Hills, Illinois, to John Palmer, Ohio EPA, Twinsburg, Ohio).

The horizontal and vertical extent of groundwater contamination has been established. The plume does not appear to intersect any downgradient surface water bodies.

5. Is the **discharge** of "contaminated" groundwater into surface water likely to be **"insignificant"** (i.e., the maximum concentration [3] of each contaminant discharging into surface water is less than 10 times their appropriate groundwater "level," and there are no other conditions (e.g., the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?

_____ If yes - skip to #7 (and enter "YE" status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration[3] of key contaminants discharged above their groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) provide a statement of professional judgement/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.

_____ If no - (the discharge of "contaminated" groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration[3] of each contaminant discharged above its groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations[3] greater than 100 times their appropriate groundwater "levels," the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing.

_____ If unknown - enter "IN" status code in #8.

Rationale and Reference(s): Not Applicable

[3] As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

6. Can the **discharge** of "contaminated" groundwater into surface water be shown to be "**currently acceptable**" (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented[4])?

_____ If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site's surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR
2) providing or referencing an interim-assessment,[5] appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment "levels," as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

_____ If no - (the discharge of "contaminated" groundwater can not be shown to be "**currently acceptable**") - skip to #8 and enter "NO" status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

_____ If unknown - skip to 8 and enter "IN" status code.

Rationale and Reference(s): Not Applicable

[4] Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

[5] The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

7. Will groundwater **monitoring** / measurement (and surface water / sediment / ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the "existing area of contaminated groundwater?"

✔ If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the "existing area of groundwater contamination."

_____ If no - enter "NO" status code in #8.

_____ If unknown - enter "IN" status code in #8.

Rationale and Reference(s): The horizontal and vertical extent of groundwater contamination has been established. Any anthropogenic source (waste materials or contaminated soils) currently present will be excavated and removed according to the current proposed closure remedy. Monitoring will continue on a quarterly basis until all wastes and contaminated materials are removed from the site. It is expected that the removal of the source will mitigate the groundwater contamination. Eight quarters of confirmatory sampling will be performed after the removal to ensure that the groundwater remains unaffected by any unknown sources attributable to the unit. Failure to remediate any anthropogenic constituents of concern will require the facility to submit an amended closure plan. (Because the unit is a former coal mine, some constituents identified in the groundwater may not be attributable to anthropogenic activities.)

For details of the groundwater sampling, detection and assessment plans, see Appendices I and J of the June 2000 *Landfill Closure / Post Closure Plan Revision No. 3.*

Plan view and cross-section drawings illustrating the monitoring network, a tabular description of the network, and brief written descriptions of the network, well installation and strategy to determine background groundwater quality, are attached.

8. Check the appropriate RCRIS status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

✔ YE - Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the American Steel Foundries Sebring facility, EPA ID # OHD 017497587, located at Lake Park Boulevard and Heacock Road, Smith Township, Ohio. Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater" This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

____ NO - Unacceptable migration of contaminated groundwater is observed or expected.

____ IN - More information is needed to make a determination.

Completed by:
Date: January 30, 2001

John Palmer
Environmental Specialist 3
Ohio EPA, NEDO, DHWM

Reviewed by:
Date: 01/30/01

Wade Balser
Environmental Specialist 2
Ohio EPA, NEDO, DHWM

Supervisor:
Date: 01/30/01

Harry Courtright
Environmental Supervisor
Ohio EPA, NEDO, DHWM

Locations where references may be found:

Ohio EPA, Northeast District Office
2110 East Aurora Road
Twinsburg, Ohio 44087
(Phone) (330) 963-1200

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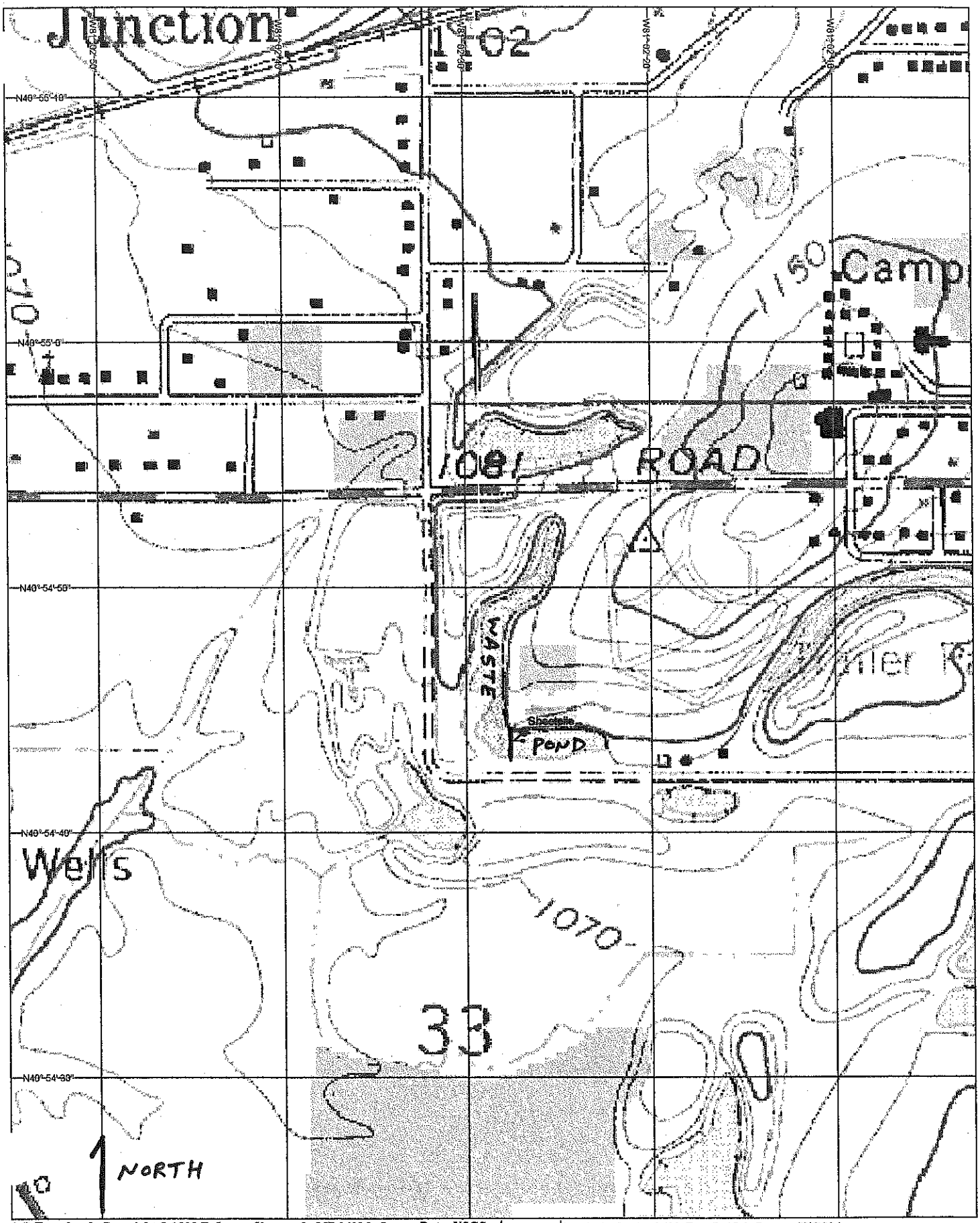
John Palmer, Ohio EPA	john.palmer@epa.state.oh.us
Harry Courtright, Ohio EPA	harry.courtright@epa.state.oh.us
Phone Number: (330) 963-1200	



 250 ft Scale: 1 : 6,400 Detail: 15-0 Datum: WGS84

ORIGINAL IN COLOR

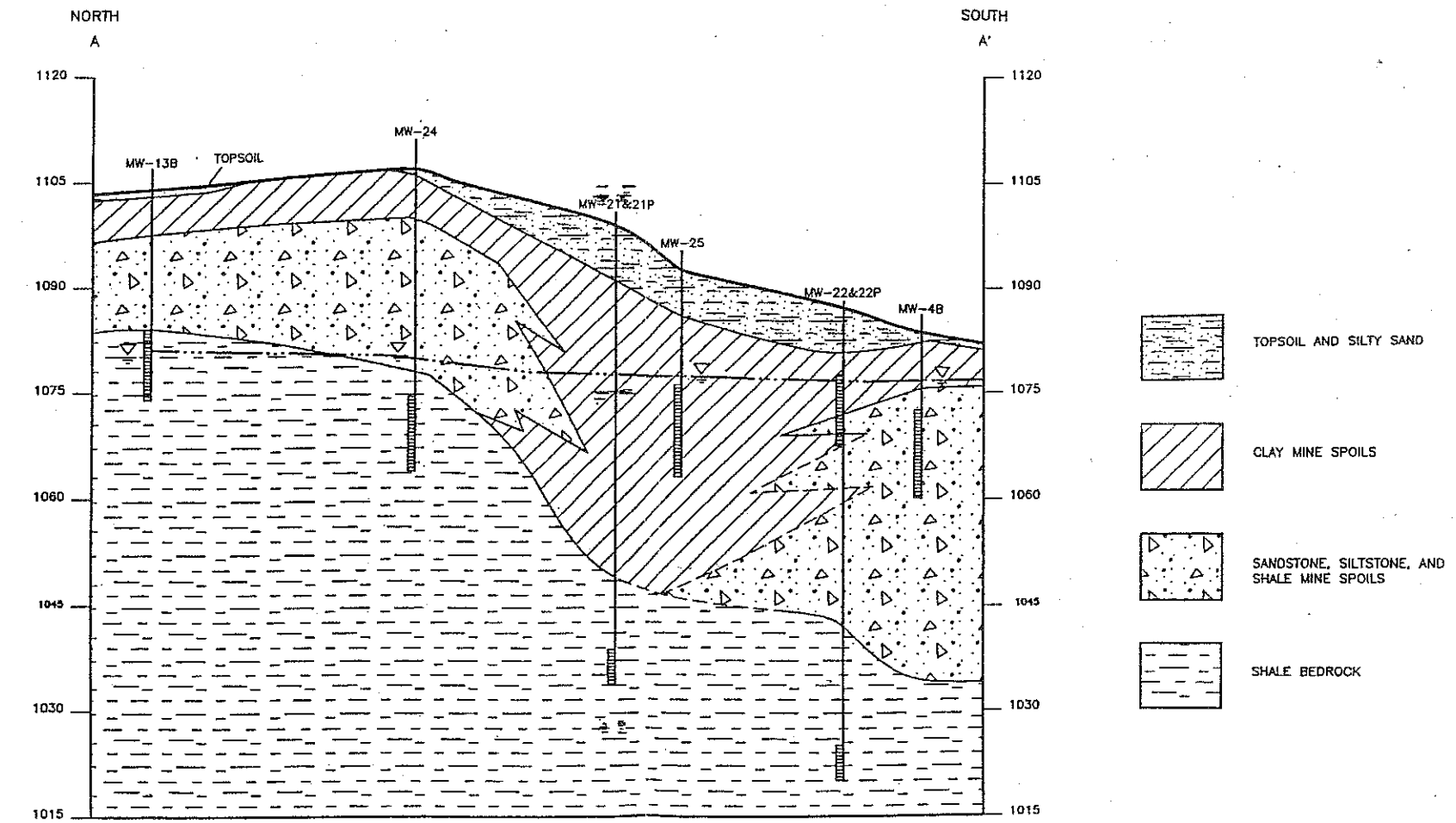
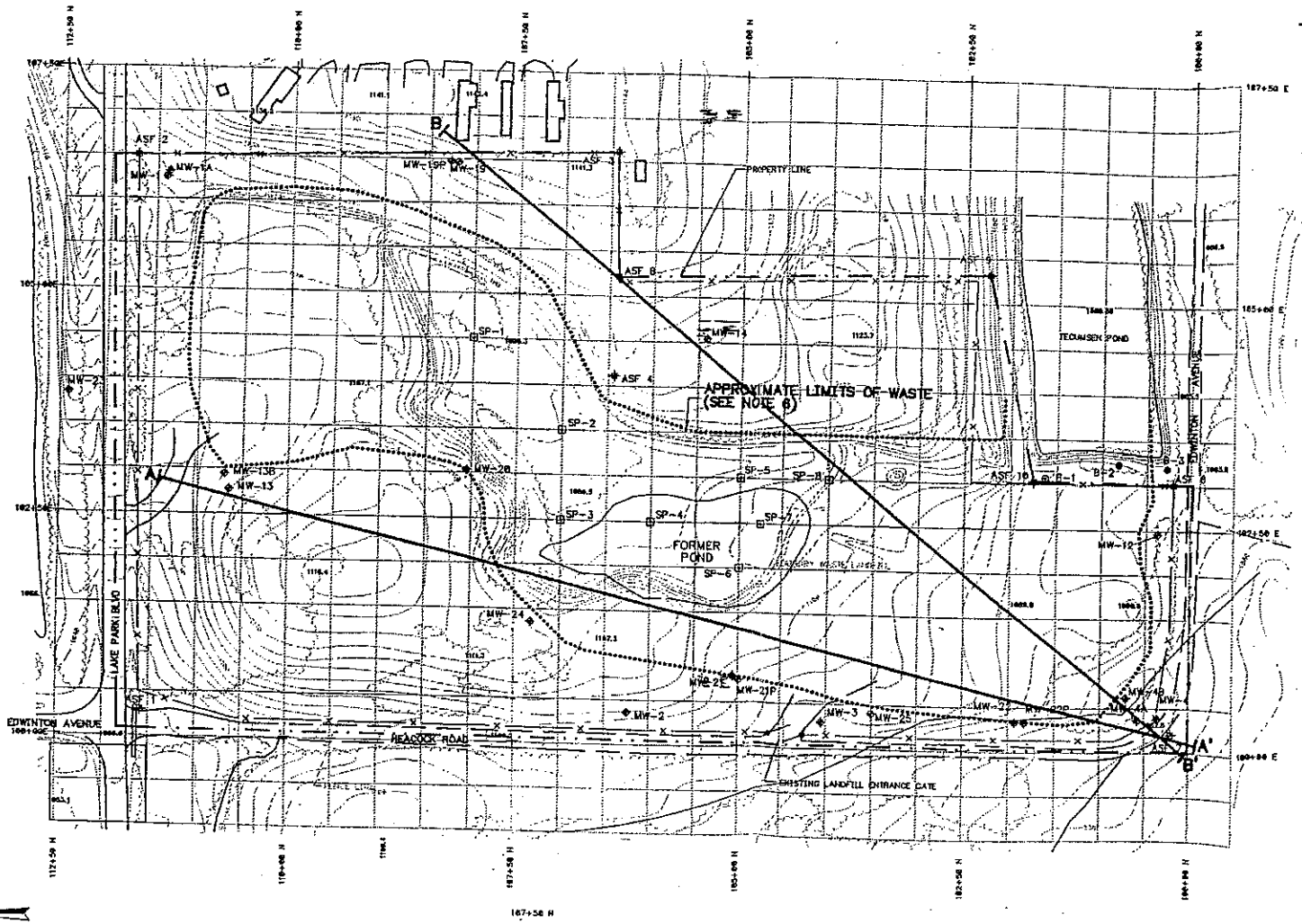


FIGURE 2-4

CROSS-SECTION A – A'
SEBRING FACILITY
AMERICAN STEEL FOUNDRIES
Alliance, Ohio

WESTON MANAGERS DESIGNERS/CONSULTANTS
Three Hawthorn Parkway
Vernon Hills, Illinois
60061



LEGEND

- PROPERTY LINE
- CULVERT
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EXISTING BUILDING
- EXISTING FENCE
- EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- 1066.5 EXISTING SPOT ELEVATION
- TREES AND / OR BRUSH
- MW-5 MONITORING WELL LOCATION AND NUMBER
- ASF 2 SURVEY MONUMENT
- APPROXIMATE LIMITS OF WASTE (SEE NOTE 6)
- B-1 BORING LOCATION AND NUMBER
- SETTLEMENT PLATE PIPER

NOTES

1. PROPERTY LINE SURVEY OBTAINED FROM HAMONTREE AND ASSOCIATES, LTD., CANTON-AKRON OHIO. DATE OF SURVEY IS APRIL 16, 1985 WITH ADDITIONAL SURVEY CONDUCTED IN JUNE 1986.
2. TOPOGRAPHIC BASE MAP WAS OBTAINED FROM KRM INC. OF GRAND FORKS, ND DATE OF PHOTOGRAPHY NOV. 17, 1991.
3. THE LIMITS OF WASTE ARE BASED ON INFORMATION PROVIDED BY AMERICAN STEEL FOUNDRIES.
4. CONTOUR INTERVAL IS TWO FEET AND ELEVATIONS ARE REFERENCED TO USGS MEAN SEA LEVEL DATUM.
5. COORDINATE GRID IS SITE SPECIFIC AND IS BASED ON THE SOUTHWEST PROPERTY CORNER (IDENTIFIED BY A 1/2" RE-BAR) WHICH HAS THE COORDINATES OF 100000, 100000.
6. THE ACTUAL LIMITS OF WASTE WILL BE IDENTIFIED BY EXCAVATION DURING CONSTRUCTION OF THE FINAL COVER. THE FINAL COVER WILL BE ADJUSTED ACCORDINGLY TO EXTEND BEYOND THE LIMITS OF WASTE BY A MINIMUM OF 10 FEET AROUND THE ENTIRE LANDFILL UNLESS PROPERTY BOUNDARIES WILL NOT ALLOW.

SURVEY MONUMENT COORDINATE TABLE

MONUMENT NO.	NORTHING	EASTING
ASF 1	101156.33	99827.57
ASF 2	101172.85	100463.90
ASF 3	100643.48	100668.81
ASF 4	100427.34	101486.87
ASF 5	100917.8	102901.5
ASF 7	100028.9	100028.9
ASF 8	100448.29	100636.82
ASF 9	100214.88	100631.17
ASF 10	99978.10	102602.84

NOTE: ASF 6 MONUMENT IS A 3/4" ALUMINUM PIPE w/CAP SET. ALL OTHER ASF POINTS ARE METAL SURVEYOR MONUMENTS. VERTICAL CONTROL WILL BE ESTABLISHED PRIOR TO CONSTRUCTION.

SOURCE MAP: RMT, INC.

0 125'
SCALE

JTN-06/23/95-08:39-J:\CAD93\100\19795

WESTON MANAGERS DESIGNERS/CONSULTANTS
Three Hawthorn Parkway
Vernon Hills, Illinois
60061

FIGURE 2-3

CROSS-SECTION LOCATION MAP
SEBRING FACILITY
AMERICAN STEEL FOUNDRIES
Alliance, Ohio

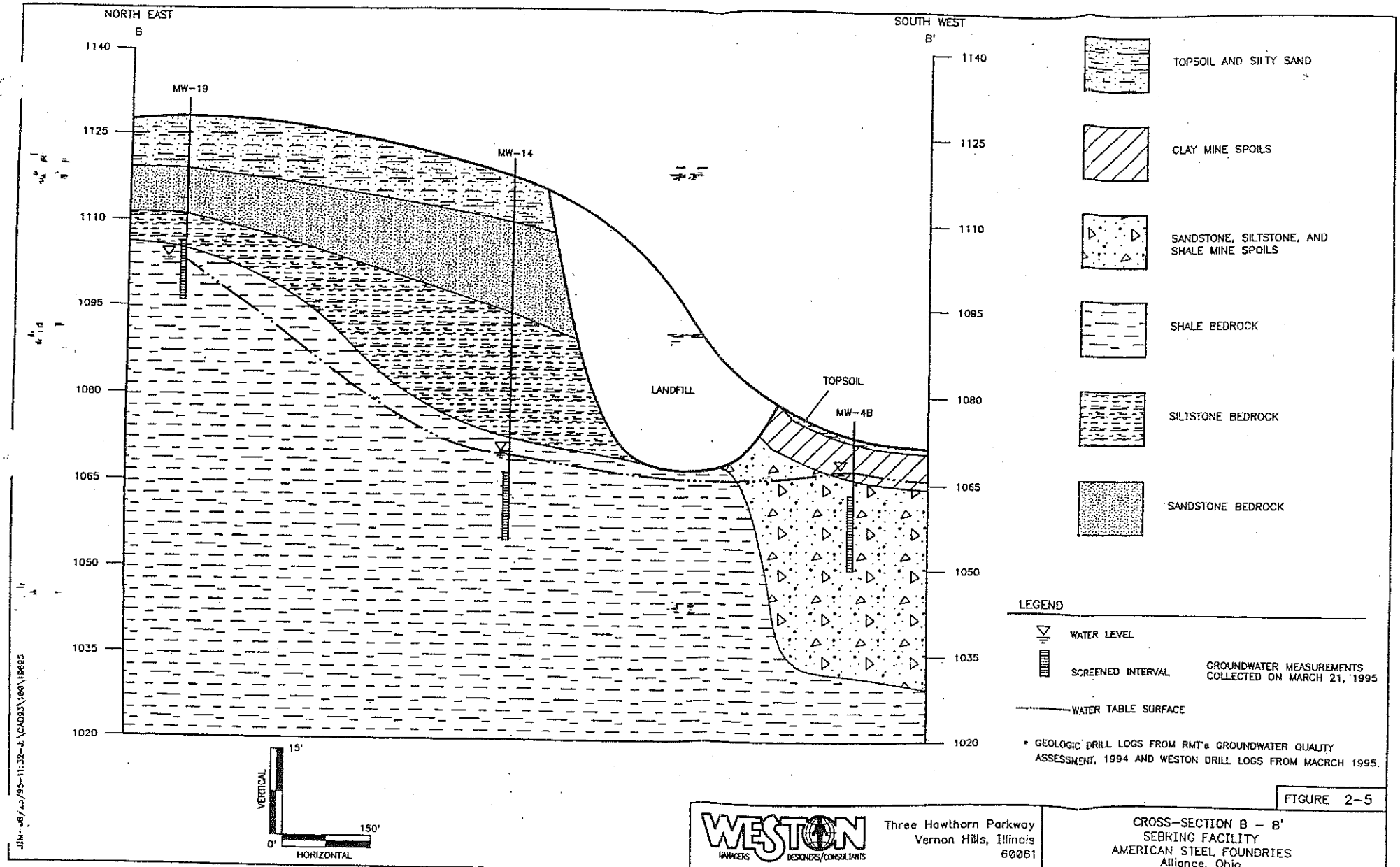
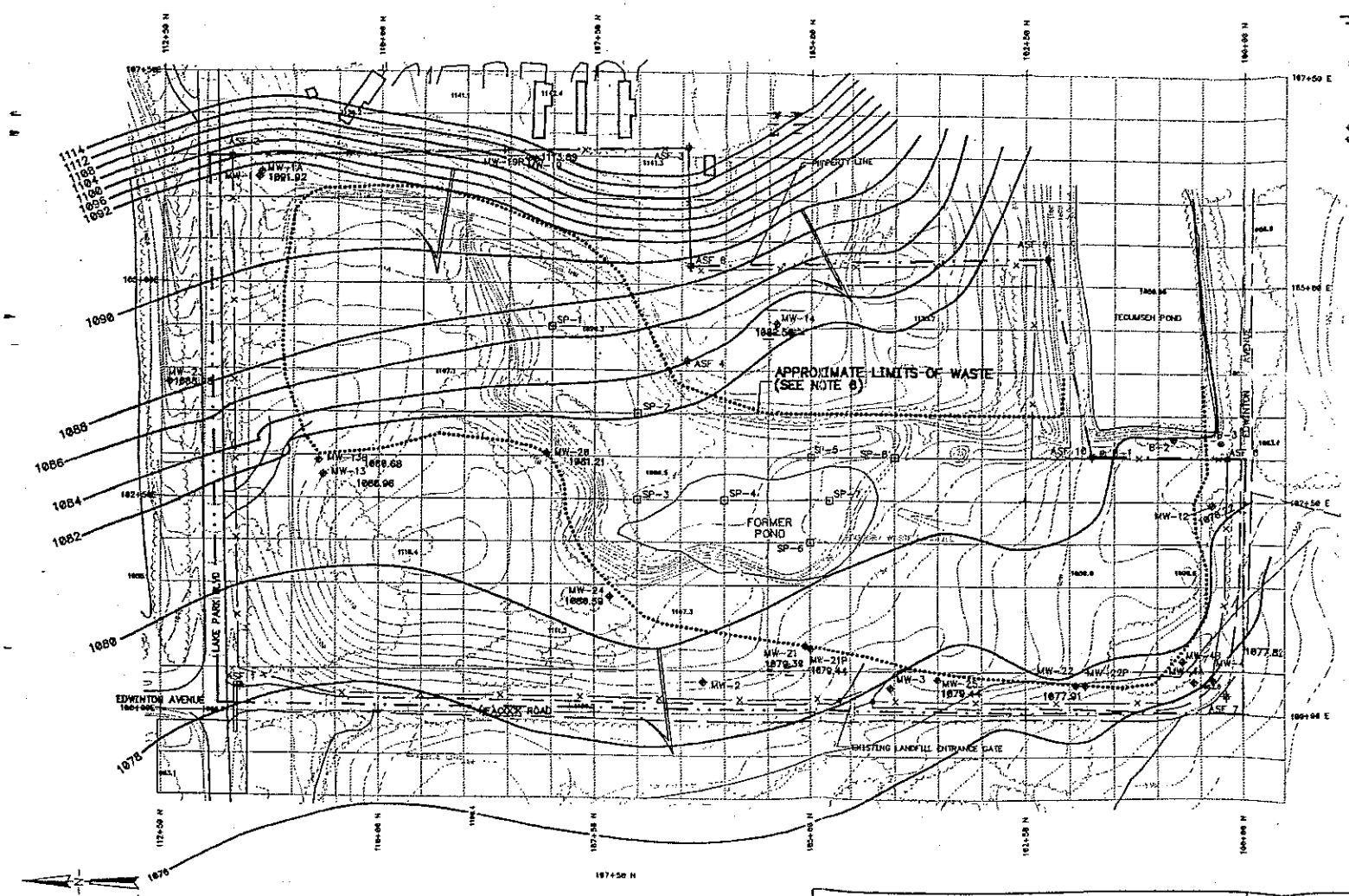


FIGURE 2-5

WESTON MANAGERS DESIGNERS/CONSULTANTS

Three Hawthorn Parkway
Vernon Hills, Illinois
60061

CROSS-SECTION B – B'
SEBRING FACILITY
AMERICAN STEEL FOUNDRIES
Alliance, Ohio



LEGEND

- PROPERTY LINE
- CLAIMANT
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EXISTING BUILDING
- EXISTING FENCE
- EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- 1000.5 EXISTING SPOT ELEVATION
- TREES AND / OR BRUSH
- MW-5 MONITORING WELL LOCATION AND NUMBER
- ASF 2 SURVEY MONUMENT
- APPROXIMATE LIMITS OF WASTE (SEE NOTE 6)
- B-1 BORING LOCATION AND NUMBER
- SETTLEMENT PLATE RISER

NOTES

1. PROPERTY LINE SURVEY OBTAINED FROM HAMMONTREE AND ASSOCIATES, LTD., CANTON-AKRON OHIO. DATE OF SURVEY IS APRIL 15, 1988 WITH ADDITIONAL SURVEY CONDUCTED ON JUNE 1988.
2. TOPOGRAPHIC BASE MAP WAS OBTAINED FROM KRM INC. OF CRAIG PARKS. NO DATE OF PHOTOGRAPHY NOV. 17, 1988.
3. THE LIMITS OF WASTE ARE BASED ON INFORMATION PROVIDED BY AMERICAN STEEL FOUNDRIES.
4. CONTOUR INTERVAL IS TEN FEET AND ELEVATIONS ARE REFERENCED TO USGS MEAN SEA LEVEL DATUM.
5. COORDINATE GRID IS SITE SPECIFIC AND IS BASED ON THE SOUTHWEST PROPERTY CORNER (IDENTIFIED BY A 1 /2 " RE-BAR) WHICH HAS THE COORDINATES OF (100000, 100000).
6. THE ACTUAL LIMITS OF WASTE WILL BE IDENTIFIED BY EXCAVATION DURING CONSTRUCTION OF THE FINAL COVER. THE FINAL COVER WILL BE ADJUSTED ACCORDINGLY TO EXTEND BEYOND THE LIMITS OF WASTE BY A MINIMUM OF 10 FEET AROUND THE ENTIRE LANDFILL UNLESS PROPERTY BOUNDARIES WILL NOT ALLOW.

SURVEY MONUMENT COORDINATE TABLE

MONUMENT NO.	NORTHING	EASTING
ASF 1	11158.33	96827.57
ASF 2	11172.85	100418.90
ASF 3	10543.48	100466.61
ASF 4	10437.38	100486.67
ASF 5	10017.8	100391.5
ASF 6	10028.8	100228.8
ASF 8	10048.39	100128.82
ASF 9	10234.58	100131.12
ASF 10	10170.78	101382.84

NOTE: ASF 9 MONUMENT IS A 3/4 " ALUMINUM PIPE w/CAP SET. ALL OTHER ASF POINTS ARE METAL BURNSTEIN MONUMENTS. VERTICAL CONTROL WILL BE ESTABLISHED PRIOR TO CONSTRUCTION.

SOURCE MAP: RMT, INC.

JIM-05/23/95-08:38-A:\CAD93\100\19795

FIGURE 2-6

WESTON MANAGERS DESIGNERS/CONSULTANTS

Three Hawthorn Parkway
Vernon Hills, Illinois
60061

GROUNDWATER FLOW MAP
SEBRING FACILITY
AMERICAN STEEL FOUNDRIES
Alliance, Ohio

Table 3-1

Monitoring Well Network
American Steel Foundries
Sebring Landfill
Alliance, Ohio

Well Number	Top of Inner Casing (TOC) Elevation (ft. MSL)	Well Depth from TOC (ft.)	Well Bottom Elevation (ft. MSL)	Screened Internal Elevation (ft. MSL)	Stratigraphic Unit Monitored	Relative Position
MW-1A	1,126.09	42.59	1,083.50	1,093.50 - 1,083.50	Shale	Upgradient
MW-14	1,131.18	62.80	1,068.38	1,078.38 - 1,068.38	Shale	Upgradient
MW-19	1,141.16	34.70	1,106.46	1,116.46 - 1,106.46	Shale	Upgradient
MW-23	1,107.81	27.55	1,080.26	1,090.26 - 1,080.26	Mine Spoils	Upgradient
MW-4B	1,085.76	25.22	1,060.54	1,070.54 - 1,060.54	Mine Spoils	Downgradient
MW-12	1,087.94	37.50	1,050.44	1,060.44 - 1,050.44	Mine Spoils	Downgradient
MW-13B	1,106.80	32.30	1,074.50	1,084.50 - 1,074.50	Shale	Downgradient
MW-20	1,113.21	41.50	1,071.71	1,081.71 - 1,071.71	Shale	Downgradient
MW-21	1,101.12	32.60	1,068.52	1,078.52 - 1,068.52	Mine Spoils	Downgradient
MW-21P	1,101.12	67.31	1,033.81	1,038.81 - 1,033.81	Shale	Downgradient
MW-22	1,091.01	22.11	1,068.90	1,078.90 - 1,068.90	Mine Spoils	Downgradient
MW-22P	1,091.23	67.10	1,024.13	1,029.13 - 1,024.13	Shale	Downgradient
MW-24	1,110.96	45.22	1,065.74	1,075.64 - 1,065.74	Shale	Downgradient
MW-25	1,095.39	30.30	1,065.09	1,075.09 - 1,065.09	Mine Spoils	Downgradient

SECTION 3

PROPOSED GROUNDWATER MONITORING PROGRAM

This section describes the proposed groundwater monitoring program that will be utilized to fulfill the requirements during the post-closure period at the ASF Sebring facility.

Pursuant to paragraph (D)(1) and (2) of OAC Rule 3745-65-90, ASF will implement a groundwater monitoring program capable of determining the facility's impact on the quality of groundwater in the uppermost aquifer underlying the facility. This monitoring program will consist of a groundwater monitoring well network that meets the requirements of OAC 3745-65-91. The groundwater monitoring program shall comply with Rules OAC 3745-65-92 through OAC 3745-65-94. The groundwater monitoring system will be installed and operated in accordance with rules OAC 3745-65-90 through OAC 3745-65-94.

3.1 PROPOSED MONITORING WELL NETWORK

The proposed groundwater monitoring network consists of 14 wells. Six wells (MW-4B, MW-12, MW-21, MW-22, MW-23, and MW-25) are screened within the mine spoils. Groundwater was first encountered within the mine spoils at these locations and is, therefore, considered to be the uppermost groundwater-producing zone. Eight wells (MW-1A, MW-14, MW-19, MW-13P, MW-20, MW-21P, MW-22P, and MW-24) are screened within shale bedrock. These are locations where the bedrock constitutes the uppermost groundwater-producing zone (upgradient side of the landfill), or locations where the waste within the landfill may be in direct contact with shale (downgradient side of the landfill). Figure 3-1 shows the location of each well within the proposed monitoring well network. The rationale for each location is as follows:

- Wells MW-1A, MW-14, and MW-19 are located along the eastern, upgradient side of the landfill boundary. These wells are screened within the upper portion of the shale bedrock and will be used as background measuring points for groundwater occurring in the bedrock.

- Well MW-23 is located on the north, upgradient side of the landfill boundary. This well is screened within mine spoils and will be used as the background measuring

point for groundwater occurring in the mine spoils.

- Wells MW-4B, MW-21, MW-22, and MW-25 are located adjacent to the western, downgradient boundary of the landfill. These wells are screened within mine spoils and will be used as downgradient monitoring points for groundwater occurring within mine spoils.

- Well MW-12 is located adjacent to the southeast, downgradient side of the landfill boundary. This well is screened within the upper portion of the shale bedrock and will be used as a downgradient monitoring point for groundwater occurring in bedrock, where the bedrock is likely in contact with landfill waste.

- Wells MW-13P, MW-20, MW-21P, MW-22P, and MW-24 are located adjacent to the western, downgradient boundary of the landfill. These wells are screened within the upper portion of the shale bedrock and will be used as downgradient sampling points for groundwater occurring in the bedrock, where the bedrock is likely in contact with landfill waste.

Table 3-1 presents a summary of the proposed monitoring well network and includes the elevation of the top of the well casing, well depth, elevation of the screened interval, elevation of the bottom of the well, the unit that the well will monitor, and the location of the well relative to the landfill.

3.2 MONITORING WELL INSTALLATION

Wells MW-1A, MW-12, and MW-14 were installed by RMT in 1991. Wells MW-19, MW-20, MW-21, MW-21P, MW-22, MW-22P, and MW-23 were installed by RMT in November 1993. All of the monitoring wells installed by RMT were installed using the procedures outlined in the Groundwater Sampling Plan (RMT, 1992). Four additional wells (MW-4B, MW-13P, MW-24, and MW-25) were installed by WESTON in March 1995, using the procedures outlined in Section 4.2 of this plan. Boring logs and well construction details for each monitoring well in the proposed monitoring network are provided in Appendix B.

3.3 BACKGROUND GROUNDWATER QUALITY

Pursuant to Paragraphs C(1) and C(2) of OAC 3745-65-92, the entire monitoring network was sampled during the initial year of groundwater monitoring, and the groundwater was analyzed to

establish background groundwater quality for the facility. Groundwater was sampled for the water quality and indicator parameters included on Table 3-1 of the Groundwater Sampling Plan (RMT, 1992), volatile organic compounds (VOCs), and Appendix IX Metals. As a result of these analyses and a review of the waste constituents, a list of proposed analytical parameters was submitted to OEPA in a draft Closure Plan (RMT, 1994). Subsequent to this submittal, ASF and the OEPA have agreed upon a final analytical list for the monitoring program. In accordance with the sampling approach presented to OEPA in a 27 April 1995 meeting, the groundwater monitoring program will include the semi-annual sampling of all monitoring wells included in the monitoring network for the site-specific indicator parameters listed in Table 3-2. Table 3-3 presents the laboratory analytical methods and respecting limits for each parameter.

The initial four quarters of groundwater analytical data for these parameters have been used to provide a statistical background set from which to make comparison of future groundwater quality during the post-closure period. Since the uppermost groundwater-producing zone varies between two different type of strata (i.e., mine spoils and shale bedrock), the chemistry of the groundwater is also highly variable. For this reason, two corresponding sets of background data have been established. One background data set has been established for the upgradient mine spoils well (MW-23), and one set has been established for the upgradient shale bedrock wells (MW-1A, MW-14, and MW-19).

Background sampling was completed in December 1993, March 1994, June 1994, and September 1994. In addition, data collected during the first semi-annual detection monitoring sampling event (March 1995) was added to the statistical background data set for shallow background well MW-23, to increase the statistical base from which to calculate background groundwater quality for the mine spoils unit.